



THE KLAMATH KALEIDOSCOPE

A Newsletter of the Klamath Network

Inventory and Monitoring Program

Winter/Spring 2012

Science and the Centennial

By **Daniel Sarr**, Klamath Network Inventory and Monitoring Coordinator

As the National Park Service approaches its Centennial in 2016, an auspicious birthday shared with Crater Lake (in 2002), Oregon Caves (in 2009), and Lassen Volcanic (in 2016), it is a great time to think about the role that science might play in the parks in their second century.

Klamath Network Inventory and Monitoring Program was created to increase the scientific information base for natural resource management in the parks. Over the last 12 years, this effort has taken a variety of forms, from initial organizational meetings, to a multiyear inventory and data mining effort, to the development of a vital signs monitoring program.

As of 2012, we are approaching the conclusion

of seven years of monitoring program development, with peer-reviewed monitoring and data management plans, and long-term monitoring protocols to provide information about terrestrial and aquatic ecosystems, biodiversity, and landscape dynamics in the six parks of the Klamath Network.



Ice Cave at Lava Beds National Monument.

Although refinements will undoubtedly be needed as we implement the program, the questions are no longer centered on what science we will do, or how we will do it, but what will it mean for the parks. How will management be improved to meet our preservation mission? How can local science efforts inform interpretation programs and improve the visitor experience? In other words, how can we help the parks

with the best possible science-based management and interpretation.

This is not a question that I&M staff can answer alone. It requires ideas and input from all the parks and their visitors. We look forward to that conversation.

At this stage, the Klamath I&M Program is fully formed, with an excellent staff, inter and intranet web presence, monitoring protocols nearly complete, and solid working relationship with Southern Oregon University and other universities and agencies across the region. However, we would like to do better.

In 2011, the I&M Program prepared a Five Year Improvement plan aimed at improving its staffing, science, and communication efforts. This winter Linda Mutch, Ecologist and Science Communication Specialist for the Sierra Nevada Network, will be helping us to better articulate and prioritize our efforts through the development of a science communication plan, which will follow a similar timeline.

The Science Communication Plan, described in more detail by Linda Mutch in this issue, will be a vehicle to help us to interact more often and develop a collaborative vision of science and learning in the Klamath Network.



Sunrise at Battery Point Lighthouse, located near Redwood National Park.

The Klamath Network Inventory and Monitoring Program

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Newsletter edited by Katelyn Detweiler

The Parks of the Klamath Network:

Crater Lake National Park

www.nps.gov/crla/

(541) 594-3100

Lassen Volcanic National Park

www.nps.gov/lavo/

(530) 595-4444

Lava Beds National Monument

www.nps.gov/labe/

(530) 667-2282 Ex.232

Oregon Caves National Monument

www.nps.gov/orca/

(541) 592-2100

Redwood National Park

www.nps.gov/redw/

(707) 464-6101

Whiskeytown Natl. Recreation Area

www.nps.gov/whis/

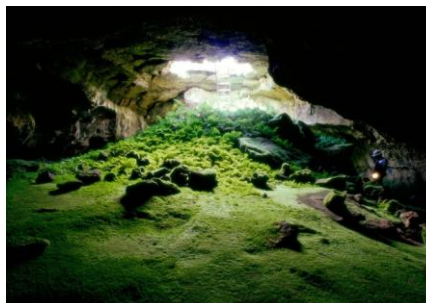
(530) 246-1225

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**Lassen
Volcanic
National Park**



**Lava Beds
National
Monument**



**Oregon Caves
National
Monument**



**Redwood
National Park**



**Whiskeytown
National
Recreation
Area**



**Crater Lake
National Park**

Why a Science Communication Plan?

By **Linda Mutch**, Ecologist & Science Communication Specialist for the Sierra Nevada Network

“Put it before them briefly so they will read it, clearly so they will appreciate it, picturesquely so they will remember it and, above all, accurately so they will be guided by its light.” - Joseph Pulitzer

This was sound advice from journalist Joseph Pulitzer regarding communication of news to a variety of public audiences. It could also be applied to scientists who must communicate technical information to diverse audiences.

The Inventory and Monitoring (I&M) Program was established to help fill in some of the important gaps in the information parks have about the current condition of park resources and how that condition is changing over time. For this information to meet its intended purpose of being useful to park managers, partners, scientists, and other public audiences, it must be accessible and effectively communicated.

The Klamath Network (KLMN) I&M staff have already been very active communicating about inventory and monitoring projects. A [website](#) provides a central location for their communication

products. These products include the Klamath Kaleidoscope Newsletter, Resource Briefs, Featured Creatures, technical reports, annual administrative reports and work plans, and scientific journal articles. KLMN also developed some educational products through a Strategic Interpretive Plan (2005-2009). KLMN staff organize an annual meeting to update park superintendents, resource managers, and interpreters on network progress and future plans and give occasional presentations in parks.

So, if they are already doing all these things, why is a science communication plan needed?

The KLMN must rely on existing I&M staff (plus intermittent interns and occasional contributions from park staff) to meet its communication needs. A science communication plan will outline goals and objectives, define key audiences, describe the most effective communication approaches, identify timelines and roles and responsibilities, and provide some templates for communication products. It is an opportunity to define and formalize the program's communication strategies and keep the focus on the highest priority needs.

I recently have completed a science communication plan for the Sierra Nevada Network where I work part-time as a science communication specialist. In the next few months, I am working with the KLMN I&M and park staffs to develop a local plan. On December 8, Daniel Sarr and I coordinated a scoping meeting in Ashland that was attended by over 20 KLMN staff members. This meeting was the initial step in getting

park staff feedback, and we thank all those who were able to participate.

Please contact Daniel Sarr (Dan.Sarr@nps.gov) or Linda Mutch

(Linda.Mutch@nps.gov) if you would like to be added to our mailing list of those interested in reviewing or contributing to this plan as it develops!

Klamath Network Safety Plan

By **Eric Dinger**, Klamath Network Inventory & Monitoring Aquatic Ecologist

Safety. Every field employee in the Network approaches a day in the wild as an intrepid adventurer, off to slay the proverbial dragon (in this case, serving to inform managers and scientists of park resources). All too often, they approach this with a certain bravado of the champion knight, thinking only of the rich bounty of scientific data. But this bravado can lead to risks – risks that can result in accidents, loss of data, and loss of working hours (and even worse). A safety plan is being developed to manage the risks inherent in this “dragon slaying.”

Our plan will build on safety protocols already in our Vital Signs monitoring, but will also be broadly adaptable to any Network project (research, inventory, or other projects). General guidance on common hazards to field work (e.g., inclement weather, dangerous animals, and persistent park visitors asking questions) will be covered, along with safety standards for communicating and

interacting with each park unit. This will lay out exactly how Network employees should coordinate with park dispatches for check-in/out procedures, if required, and also mandate orientation sessions with a park contact prior to starting work. An additional section will focus on ensuring efficient response to serious incidents and how to get help to an injured party

as soon as possible. And of course, a riveting section on administrative reporting requirements in the event of any accident, be it a strained toe or life-threatening injury, will be covered.

The plan is being developed with input from all six park units, and seeks to ensure that the Network safety standards are similar to the parks we are working in. The draft plan should be done within a couple of fortnights.



Little Bald Hills: A Disappearing Gem?

By **E. April Sahara**, graduate student at Humboldt State University
and **Erik S. Jules**, Professor of Biology at Humboldt State University

Beginning near Stout Grove in Jedediah Smith Redwoods State Park, the Little Bald Hills trail switchbacks its way up a 1000' climb through towering old-growth redwoods and ethereal second-growth Douglas-fir stands, only to suddenly and dramatically open up to the beauty of a serpentine Jeffrey pine savannah. This ecological treasure, encompassing a small area of roughly 145 hectares, is surrounded by a matrix of dense mixed-evergreen forest. The sharp ecological transition to Jeffrey pine savannah is due to the underlying serpentine soil that runs in a narrow band through this area.

Serpentine soil is a general term applied to the many different soil types derived from ultramafic rock types. These soils have many properties in common, including high concentrations of toxic metals and low levels of plant nutrients, which lead to unusual associations of plants that are not often found on other soils. Serpentine indian pink (*Silene serpentinicola*), Siskiyou paintbrush (*Castilleja miniata* ssp *elata*), wedgeleaf violet (*Viola cuneata*), Siskiyou mat (*Ceanothus pumilus*), and Howell's sandwort (*Minuartia howellii*) are some of the serpentine-associated herbaceous plants found here. Both the serpentine indian pink and Howell's sandwort are California Native Plant Society 1b listed plants, meaning they are threatened, rare, or endangered in California and elsewhere.



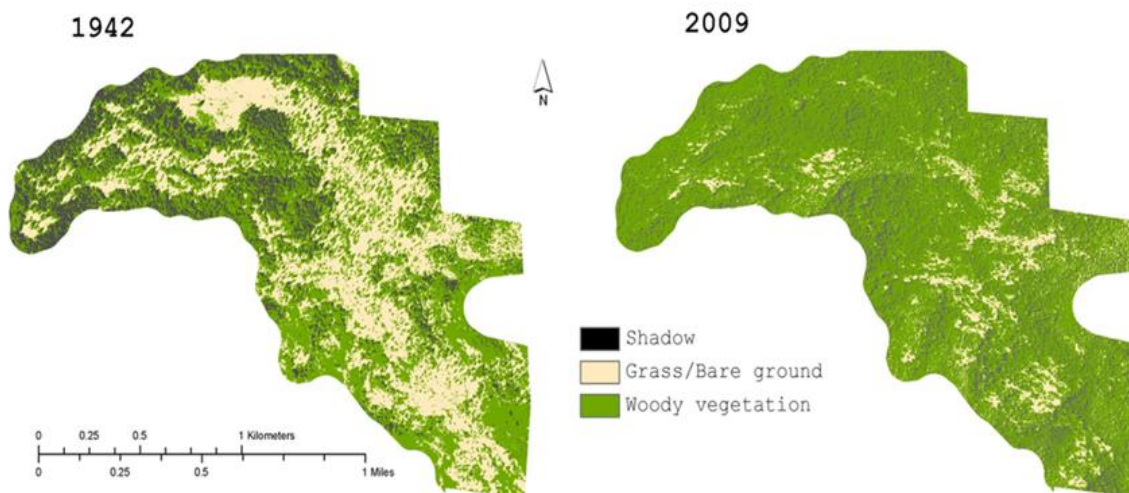
Serpentine Jeffrey pine savannah in the Little Bald Hills.

Unfortunately, in the Little Bald Hills this serpentine savannah is being lost due to the establishment of large numbers of trees amongst the scattered old pines, reducing the area in which the grasses and endemic forbs can exist. In order to quantify the rate and the extent of this encroachment of trees into the savannah, we have been collecting both field data and data from historical aerial photos, with help from the National Parks through funds provided by the Klamath Network's Inventory and Monitoring Program. What we've found is that Little Bald Hills was composed of >

40% grassland in the 1940s, but by 2009 grassland made up only ~10%; the rest of the area has been converted to woody vegetation, primarily Jeffrey pine and Douglas-fir. Prior to 1850, tree establishment was very sporadic and few trees were evident across the landscape. The latter half of the 19th century and the beginning of the 20th saw steady establishment of both Jeffrey pines and Douglas-fir, but beginning in the 1940s a large spike in tree establishment occurred. This increasing trend in tree establishment has continued through the present day. In the nine decades between 1860 and 1940, the mean number of trees established per decade was 62, whereas in the six decades between 1950 and 2010 an average of 414 trees established per decade.

This Jeffrey pine savannah was probably maintained by a burning regime driven by natural lightning strikes and the native Tolowa people before European-American settlement in 1850. The nearest documented Tolowa use area was located approximately one mile away on the Smith River. The loss of fire in this system has clearly positively impacted tree establishment in this area, and if tree establishment continues at past rates, functional loss of pine savannah could happen as early as 2037.

We would like to especially thank Dr. Daniel Sarr, Leonel Arguello, Jason Teraoka, and the many people at Redwood National and State Parks who have helped in innumerable ways.



These vertical areal images of the Little Bald Hills serpentine Jeffrey pine savannah are classified into three categories, and illustrate the dramatic loss of grassland.

Pikas in Peril?

Pika Research and Monitoring in Klamath Network Parks

By **Mackenzie Jeffress**, research assistant and Pika Protocol lead of the Upper Columbia Basin Network and University of Idaho and **Lisa Garrett**, Program Manager of the Upper Columbia Basin Network

The American pika (*Ochotona princeps*) is a charismatic inhabitant of many western mountain landscapes. Recent research suggests that climate change may pose a major threat to pika populations and this has resulted in a call for more information, including long-term monitoring data, to better evaluate the status of pika populations in the future.

In 2009, resource managers from three Klamath Network parks (Crater Lake NP, Lassen Volcanic NP, and Lava Beds NM) and one Upper Columbia Basin Network (UCBN) park (Craters of the Moon NM&P) partnered with the UCBN to develop a long-term pika monitoring protocol. The objectives of the monitoring protocol are to determine current patterns and long-term trends in pika site occupancy in and across the four parks. The approach for monitoring is based on repeat presence-absence surveys of randomly-selected plots that will permit detection of changes in site occupancy patterns over time. Sites are searched for evidence of pika

presence, including sighting, calls, fresh feces, and fresh haypiles.

In 2010, the NPS Climate Change Response Program funded a research project to assess pika vulnerability amid predicted climate change. This project funded two years of occupancy surveys and the collection of genetic data in eight western parks including the three Klamath Network parks. UCBN and park staff along with university researchers are currently collaborating on the analysis of +1,000 surveys and genetic samples. Although fieldwork for the



research project is complete, long-term monitoring is scheduled to continue. Starting in the summer of 2012, Klamath parks will assume the monitoring responsibilities and data collection will be implemented at the

park level.

Ultimately, data from the research project coupled with long-term monitoring efforts will contribute to a better understanding of pika populations in Klamath parks. Due to the habitat requirements and limited dispersal ability of pikas, it is expected that

habitat in national parks may be of increasing importance as refugia and provide source populations for future colonization events. Sixteen national park units contain confirmed pika populations so this protocol creates an opportunity for

collaboration and regional synthesis of broad-scale trends. More information about the pika monitoring and research is available via the UCBN website (<http://science.nature.nps.gov/im/units/ucbn/monitor/pika/pika.cfm>).

Taking the Pulse of the Forest

Klamath Network Old-Growth Forest Plots

By **Katelyn Detweiler** with input from an interview with **Phillip van Mantgem**, United States Geological Survey

Old-growth forests may appear timeless, but there are many recent examples showing how climate change may already be impacting these forests. How will old-growth forests and their associated biota respond to changing climates across the Klamath region? A joint venture between NPS, BLM and USGS to measure changes in old-growth forest is attempting to answer this question.

To date this project has established several large (approximately 2 acre) monitoring plots in old-growth forests at the Bureau of Land Management's Cascade-Siskiyou NM, Oregon Caves NM, Crater Lake NP, Lassen Volcanic NP, and Redwood NP. At each site forests are mapped and individual trees are measured, with repeated censuses allowing for estimates of tree growth, reproduction and mortality. "The information we collect at these sites will be critical if we want to understand how our forests function and how they might respond to changing climates and biological invasions.", says lead USGS scientist Phil van Mantgem.

The 2012 field season will see additional plots established in Whiskeytown NRA and Lava Beds NM. These additional sites will help to describe how forests patterns and trends might change across the steep marine to continental climatic gradient in the Klamath region. "I'm excited about visiting these sites, working with the NPS staff and getting out in the woods!" says van Mantgem.



Measuring the big trees at Redwood National Park.

Where are the Birds?

By **Sean Mohren**, Klamath Network Inventory and Monitoring Ecologist and Data Manager

It's cloudy, rainy, and the fog is making it impossible to see more than a short distance outside my window which has caused me to start desiring the slowly approaching spring. Of course, it is hard to contemplate the spring season without thinking about the remarkable sounds of birds that liven up the morning! Have you ever pondered about where the best spot is to hear and see birds in our parks? How about which park you should go to if you want the best chance to hear or see a diversity of bird species? These are just a few of the many questions we will begin to be able to answer as we continue to implement the Klamath Network Landbird Monitoring Protocol. This year we hit a major milestone for our project by wrapping up the 2010 season which concludes a three year effort to complete one sampling event at each of the 6 parks!

As we begin to look at the data and examine how species composition differs between parks we start to see some very interesting patterns. For example, during the 3 years we implemented this project (2008-2010) we documented 165 bird species. Of these 165 species, only 24 (~15%) were observed at all the parks (Figure 1). In fact, some parks such as Whiskeytown National Recreation Area (12 species) and Lava Beds National Monument (21 species) had a large number of species that were only documented at those park units (Figure 1). While Lava Beds National Monument might contain the most unique species, this does

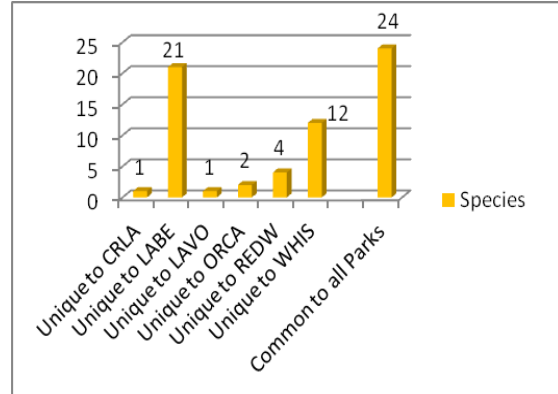


Figure 1. The number of species that were documented at one park unit along with species that were common to all parks while implementing the Landbird Monitoring Protocol.

not mean they have the highest diversity of species. As we can see from Figure 2, Whiskeytown National Recreation Area had the highest diversity with 112 species documented. This was followed by Lava Beds National Monument and Redwood National and State Parks which each had 87 species and then Lassen Volcanic National Park with 80 species of birds. A significantly fewer number of species were observed at Crater Lake National Park (60 species) and Oregon Caves National Monument (68 species).

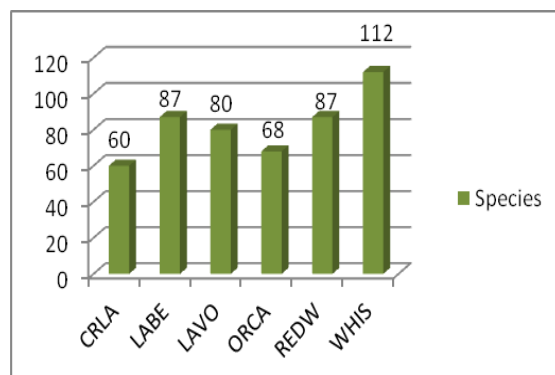


Figure 2. Diversity of species observed as part of the KLMN Landbird Monitoring Protocol.

Another opportunity we have with this project is to examine how similar or different the bird community at one park is when compared to another park. For example, when we look at the birds observed at Crater Lake National Park, on average, only about half the species also occur at other parks including LAVE (39%), LAVO (63%), ORCA (56%), REDW (49%) and WHIS (41%) as shown in Figure 3. The birds at Whiskeytown National Recreation Area on the other hand have a large overlap with other parks with at least 75% of the species at this park occurring at CRLA, LAVO, ORCA, and REDW (Figure 4).

Now that we have surveyed each park and have started to get an idea as to where landbirds occur we tend to ask ourselves why continue monitoring? Monitoring provides us with the opportunity to look at more than just a snap shot in time. It gives us a chance to see if patterns such as the ones described above continue to hold true over time or if bird communities are changing from year to year. As we continue to sample the parks we will be able to answer these questions along with many more such as what are the densities of species in each park, what habitat characteristics are important to bird species and communities in our area, and are the bird communities moving around over time or do they continue to stay in the same area?

For more information on this project please visit the landbird monitoring project page on the KLMN website at: http://science.nature.nps.gov/im/units/klmn/Monitoring/vs/Landbird/VS_Landbirds.cfm

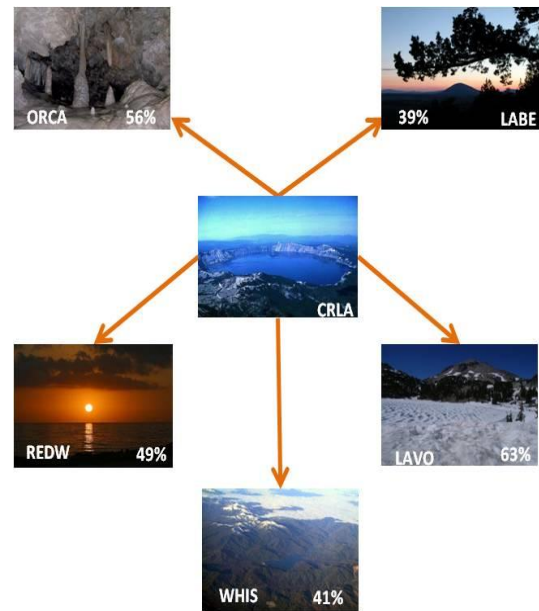


Figure 3. The percent of species found in Crater Lake National Park occur in each of the other 5 parks.

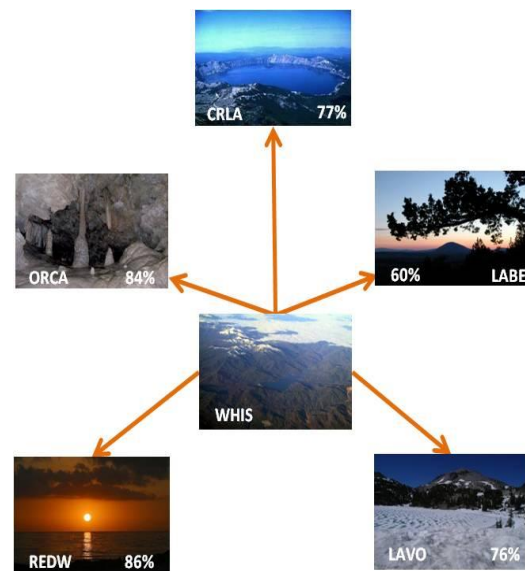


Figure 4. The percent of species found in Whiskeytown National Recreation Area that occur in each of the other 5 parks.

Natural Resource Condition Assessment Project

By **Paul Adamus**, Professor at Oregon State University

What is the current condition of natural resources in Klamath Network parks? How has that condition changed in recent years? What might be the actual and potential causes of current and future change? Scientists from Southern Oregon University and Oregon State University are helping find answers to those important

questions. For now, they are focusing on just three parks:

Lassen Volcanic NP, Lava Beds NM, and Crater Lake NP. This is part of an ongoing nationwide effort by NPS to prepare Natural Resource Condition Assessments (NRCAs) for many of our national parks. The NRCAs



View of Mt. Lassen from Reflection Lake

rely primarily on review and syntheses of existing data and maps, as contrasted with the Vital Signs Program which mainly features the collection of new field data. Both programs complement and help support each park's updating of Resource Stewardship Strategies. One component of the Lassen Volcanic National Park report will be an analysis of broad-scale changes in the distribution of major plant communities and associated wildlife species within the park, using historical and current vegetation maps. A component of the Lava Beds

National Monument report will be an analysis of long-term trends in precipitation and air temperature, interpreted in the context of sensitive cave-dwelling animals.

Lastly, a component of the Crater Lake National Park report

will be maps showing areas within the park that may require the longest times to recover if damaged by fire or insects.

Embedded in our National Parks

By **Nicholas Brandt**, Rogue Valley Community Television, Southern Oregon University

Southern Oregon University's video production company and The Klamath Network Inventory and Monitoring Program have partnered together to get the word out about the importance of inventory and

monitoring activities. A fortunate group of advanced video production students were embedded with KLMN research teams over the summer to capture the essence of the research process, as well as report some of

the findings of the summer. In order to film KLMN monitoring activities, the film crew has been hiking in Lava Beds, catching birds at Oregon Caves, stomping through streams at Whiskeytown (my personal favorite park and protocol; fishing with a car battery is awesome!). We also watched KLMN map vegetation at Crater Lake and, most recently, scaled muscle-covered tide pools and cliffs at Redwoods.



Tide pool at Redwood National Park

We have learned many things from our travels:

1. Being in the field is way better than sitting in the office.
2. Some of the field conditions that research teams encounter are less than ideal and make the job physically demanding.
3. Camera equipment was not made with field conditions in mind.
4. Monitoring the parks vital signs is important work that informs many facets of keeping our parks open.
5. What a Fun Job!

We have now completed the field portion of the project and are currently in the

editing phase. We are sorting the visual gems from the bloopers. The videos should be releasing on the Network website as early as March 1st.

The Big Move

By **Eric Dinger**, Klamath Network I&M Aquatic Ecologist

This past fall saw the stars align – some serendipitous space rearranging at SOU, along with crowded conditions in the two Network offices – led to a move and consolidation of the network office. Gone is the downstairs basement offices on campus and the little white house next to the SOU football stadium. We are now located in a multi-story house converted to office space near the southwestern edge of campus. Formerly a part of family-student housing, the new space allows all network employees to share common space, along with meeting and storage space.

We are excited that the new space will also allow us to work more closely with SOU student interns and employees on mutually beneficial projects. This has been long-term goal. In early April, the I&M Program selected two National Park Interns, Kelton Shockey and Kasey Graue, who will be working closely with us on varied aquatic and terrestrial ecology and outreach projects through the summer .

Where will we be?

| Project | Parks Included | Status |
|---|------------------------------|---|
| <i>Inventories</i> | | |
| Vegetation Mapping | CRLA, LABE, LAVO, ORCA, REDW | <ul style="list-style-type: none"> • CRLA-scoping for mapping, Field work conducted in summer 2011 and will continue in 2012 (June-September). • LABE- field work completed and classification underway in FY 2012. • LAVO-in final stages. • ORCA-field work done, classification and map development underway. • REDW-in final stages. |
| <i>Monitoring</i> | | |
| Intertidal | REDW | <ul style="list-style-type: none"> • Field sampling in December 2011, June 2012. • Second and Third annual report in review. |
| Invasive Species Early Detection | All KLMN Parks | <ul style="list-style-type: none"> • ISED protocol was implemented in all parks in FY 2011. • FY 2011 briefings will be distributed by December 2011. • Second ISED Annual Report will be completed by March 2012. |
| Vegetation | All KLMN Parks | <ul style="list-style-type: none"> • Protocol was approved in FY 2011. • First field season was completed in summer 2011 at LABE and REDW. • Second field season will commence in summer 2012 at WHIS (May-July) and LAVO (July-September). |
| Landbirds | All KLMN Parks | <ul style="list-style-type: none"> • Protocol was approved in January 2010. • Landbird monitoring will be conducted in ORCA, LAVO, and WHIS in 2012 during the early summer breeding bird season (May-July). • Fourth annual report will be completed in spring 2012 along with a resource brief. |
| Water Quality and Aquatic Communities-Lakes | CRLA, LAVO, REDW | <ul style="list-style-type: none"> • The protocol was approved in July 2011. • First season of sampling will be in summer 2013 June-September). • In FY 2012, the index of ecological integrity will be refined and analytical techniques added to the protocol, as appropriate. |
| Water Quality and Aquatic Communities-Streams | CRLA, LAVO, ORCA, REDW, WHIS | <ul style="list-style-type: none"> • The protocol was submitted for peer review in May 2010, a revised version was resubmitted in July 2011. • The first season of field sampling was conducted in FY 2011 at WHIS and LAVO. • Second field season will commence in FY 2012 at ORCA, REDW, and CRLA. (June-September). |
| Whitebark Pine | CRLA, LAVO | <ul style="list-style-type: none"> • A draft protocol was completed and submitted for peer review in FY 2010. A revised protocol will be submitted in December 2011. |
| Land Cover / Land Use | All KLMN Parks | <ul style="list-style-type: none"> • Will be working with park staff and WASO to develop a draft protocol for submission by February 2012. Revisions to the protocol will be completed in the late summer/fall and resubmitted shortly thereafter |
| Caves | LABE, ORCA | <ul style="list-style-type: none"> • Protocol was submitted in August 2010, and a revised protocol will be resubmitted in November 2011. |
| <i>Science Communication</i> | | |
| Resource Briefs | All KLMN Parks | <ul style="list-style-type: none"> • The KLMN staff has developed resource briefs describing intertidal monitoring, invasive species monitoring, and vegetation monitoring that will be disbursed in November 2011. Additional resource briefs continue the preparation of resource briefs through FY 2011 |